## **CLAIMS:**

1. A method for the synthesis of severely sterically hindered secondary aminoether alcohols of the formula

wherein R<sup>1</sup> and R<sup>2</sup> are each selected from the group consisting of alkyl, hydroxylalkyl radicals having 1 to 4 carbon atoms or in combination with the carbon atom to which they are attached they form a cycloalkyl group having 3 to 8 carbon atoms, and R<sup>3</sup> is selected from the group consisting of hydrogen, alkyl or hydroxyalkyl radicals having 1 to 4 carbon atoms, and R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, R<sup>9</sup>, R<sup>10</sup> and R<sup>11</sup> are the same or different and are selected from the group consisting of hydrogen, alkyl and hydroxyalkyl radicals having 1 to 4 carbons provided that at least one of R<sup>4</sup> or R<sup>5</sup> bonded to the carbon atom directly bonded to the nitrogen atom is an alkyl or hydroxyalkyl radical when R<sup>3</sup> is hydrogen, the process involving reacting an organic carboxylic acid anhydride, an organic carboxylic acid halide, or mixture thereof, of the general formula

wherein  $R^{12}$  and  $R^{13}$  are the same or different and each is selected from the group consisting of alkyl radicals having 1 to 4 carbon atoms, aryl radicals having hydrogen or  $C_1$ - $C_{10}$  alkyl radicals substituted therein, and mixtures thereof, and X is a halogen selected from the group consisting of F, Cl, Br, I, and mixtures thereof, with sulfur trioxide,  $SO_3$ , to yield a mixed sulfonic-carboxylic anhydride or (mixed anhydride) sulfonyl halide anhydride of formula (2)

which is reacted with a dioxane of formula (3)

$$R^{11}$$
  $O$   $R^4$   $R^5$   $R^9$   $R^6$   $R^7$ 

wherein R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, R<sup>9</sup>, R<sup>10</sup> and R<sup>11</sup> are the same or different and are selected from hydrogen, alkyl and hydroxyalkyl radicals having 1 to 4 carbons, to yield

which is then aminated with an alkylamine of the formula

$$R^1$$
 $H_2N$ 
 $R^3$ 
 $R^2$ 
 $R^3$ 

wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are as previously defined, to yield (6)

which is subsequently hydrolyzed with base to yield product (1).

2. The method of claim 1 for the synthesis of severely sterically hindered secondary aminoether alcohols using an organic carboxylic acid anhydride of the general formula

$$R^{12}$$
— $C$ — $C$ — $C$ — $R^{13}$ .

3. The method of claim 1 for the synthesis of severely sterically hindered secondary aminoether alcohols using an organic caraboxylic acid halide of the general formula

$$R^{12}$$
  $C$   $X$ 

- 4. The method according to any one of the preceding claims wherein  $R^1$ ,  $R^2$  and  $R^3$  are methyl radicals.
- 5. The method according to any one of the preceding claims wherein R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, R<sup>9</sup>, R<sup>10</sup> and R<sup>11</sup> are hydrogen.
- 6. The method according to any one of the preceding claims wherein R<sup>12</sup> and R<sup>13</sup> are the same or different and are selected from the group consisting of methyl radical and phenyl with hydrogen or methyl in the para position.

WO 2005/082837 PCT/US2005/003061

- 7. The method according to any one of the preceding claims wherein the base is selected from alkali metal hydroxide, alkali metal alkoxide, or alkali metal carbonate.
- 8. The method according to any one of the preceding claims wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are methyl and R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, R<sup>9</sup>, R<sup>10</sup> and R<sup>11</sup> are hydrogen.
- 9. The method according to any one of the preceding claims wherein the anhydride or acid halide and the SO<sub>3</sub> are reacted at a temperature between about -70° to about 50°C, the resulting mixed sulfonic-carboxylic anhydride or mixed anhydride sulfonyl halide anhydride (product 2) and the dioxane are reacted at a dioxane to product 2 molar ratio of from about 1:1 to about 10:1 at a temperature of between about 50°C to about 200°C to produce a cleavage product, the cleavage product and the alkylamine are reacted at an amine to cleavage product ratio ranging from about stoichiometric to about 10:1 at a pressure from about atmospheric (1 bar) to about 100 bars at a temperature of from about 40°C to about 200°C, the resulting aminated product being reacted with base at a temperature from about 20°C to about 110°C.
- 10. The method according to any one of the preceding claims wherein the mixing of the anhydride, acid halide, or mixtures thereof, the SO<sub>3</sub> and the dioxane is combined in a single step, the reaction mixture being heated at a temperature of between about 50°C to about 200°C to produce a cleavage product, the cleavage product and the alkylamine being reacted at an amine to cleavage product ratio ranging from about stoichiometric to about 10:1 at a pressure from about atmospheric (1 bar) to about 100 bars at a temperature of from about 40°C to about 200°C, the resulting aminated product being reacted with base at a temperature from about 20°C to about 110°C.